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SCIENCE.—SUPPLEMENT.

FRIDAY, JUNE 10, 1887.

ASPECTS OF EDUCATION.

REALISM.

SHELLEY, once writing to Godwin, expressed his surprise that so much time and thought had been given to the teaching of words, and so little to the teaching of things. Under the influence of Sturm and the Jesuits, humanism, or classical education, degenerated into a mere study of words. Little attention was paid to what was said : the chief point was how it was said. Cambridge undergraduates thirty years ago. taught by the most distinguished scholar in the university, when they read a Greek play or a Latin poem, heard little about the plot, or the allusions or their relations to modern writings of the same kind. Attention was exclusively paid to readings, to the delicate variations in the meanings of words, to grammatical forms, to letters and accents ; yet the teacher was a man full of love of English and other literatures, and steeped in the knowledge of them. The best scholars turned out of the university were surprised to find, as a result of their training, how little they knew of the literary masterpieces, which they had spent a great portion of their lives in learning to construe. The main aspects of ancient life were entirely unknown to them, unless accident had led them to learn them. Yet the teaching of things rather than words had been advocated by great educationalists, both abroad and in England.

The typical realist in education is Comenius. His whole life was devoted to the improvement of educational methods. He was one of the first to appeal to the eye as an instrument of instruction ; but his most important work was the 'Great didactics,' a complete treatise on the art of education. The central idea of this book was that the education of every man should follow his natural growth. Take the whole circle of sciences with which the mature man can be acquainted, — arithmetic, geometry, astronomy, ethics, politics, and many others, — what are these but names for departments of knowledge, which the human mind creates for itself ? If we take away from them their repulsive appellations, and consider them in their simplest elements, we find that they are nothing but what

the child learns from its earliest infancy. 'Metaphysics' is a hard word, yet what is it except the science of ideas as apprehended by the mind ? A child four years old was once lying in bed, recovering from an illness, when its father and mother came to the bedside. The child described the feeling it had in its leg. The father said, "That is pins and needles." The child thought to itself, "How can my father make so rash a statement ? What he means, expressed in inaccurate language, is, that what I am describing sounds to him as the sensation which, if he felt, he would call pins and needles ; yet how can he tell that the sensation which I am now feeling is the same as that which he denotes by that name ?" There was present to the child's mind the whole problem of the relativity of knowledge, yet that has sometimes been found hard even for men to grasp. In the same way, what is the knowledge of natural phenomena, such as fire, rain, and snow, but the knowledge of physics ? What is the ability to find his way about his own village but the rudiments of geography ? What are his family annals but the beginnings of history ? The government of the household would teach him domestic economy, the administration of his native town would teach him politics, the rules of simple behavior would teach him ethics : take away the bugbear of repulsive nomenclature, and you will find every science can be studied in its simplest elements from the beginning of life. Comenius regarded the sciences which were accessible to human knowledge as an ever-widening circle, to be learned by child, boy, and man in the measure for which their strength is adapted. When it is possible in this way, by following the course of nature itself, to arrive at the knowledge of every thing that is worth knowing, why should we confine the growing mind in the trammel of mere language ? From the mother's school the child would pass to the national school ; one existing in every house, the other in every parish. From this he will go, as years advance, to the gymnasium, which is to be found in every large town ; and thence, if strength admits, to the university, which exists in every province.

The didactic theories of Comenius met with a strange fate. His manhood was nearly coincident with the thirty-years' war, which made educational experiments impossible in Germany. He came to England just as the civil war was breaking out. That did not prevent his proposals from

attracting the attention of the parliament ; and they would have given him for his experiments some large college, either in town or country, had not political troubles made it impossible to do so. He was taken up by the Protestant powers of Europe, partly because they represented the greater spirit of progress, and partly because they were opposed to the exaggerated humanism of the Catholics. Had he lived a hundred years earlier, the effect of his teaching would have been far more powerful. Had Comenius, instead of Melanchthon, been the preceptor of Germany, Catholics and Protestants might have been divided in education, as they were in religion, but the world would have been enriched by a training of wider scope and greater possibilities. Thwarted by the political troubles of his time, his teaching never arrived at its full development, and had little effect upon the world until it received a new shape at the hands of Pestalozzi and Froebel.

The learning of things instead of words found a powerful advocate in England in the person of John Milton. His 'Tractate on education' is one of the most gorgeous dreams of a complete training ever conceived and elaborated by an educational theorist. He admits that it is right to learn the languages of those people who have at any time been most industrious after wisdom, but he asserts that language is only the instrument which conveys to us things useful to be known. "Though a linguist," he says, "should pride himself to have all the tongues that Babel cleft the world into, yet, if he have not studied the solid things in them as well as the words in lexicons, he were not so much to be esteemed a learned man as any yeoman or tradesman, competently wise in his mother dialect only." He defines a complete and generous education as that which fits a man to perform justly, skilfully, and magnanimously all the offices, both private and public, of peace and war. The Latin language, taught with the Italian pronunciation, is to lay the foundation of good morality, "infusing into their young breasts such an ingenuous and noble ardor as would not fail to make many of them renowned and matchless men." Varro and Columella are to teach, not only Latin, but agriculture,—how to recover the bad soil and to know the waste that is made of good. Aristotle and Pliny are to give instruction in science. Mathematics, comprising arithmetic, geometry, astronomy, and trigonometry, have a separate course of their own, from which progress is to be made to fortification, architecture, engineering, and navigation. Theoretical studies in these and other similar branches are to be supplemented by practical training given by experts in the several pursuits. Not until this

broad foundation of theory and practice has been laid are the pupils to read the works of those poets who treat of country lore. The next stage is to lay the foundations of philosophy and ethics, the knowledge of virtue and the hatred of vice. Plato, Xenophon, Cicero, Plutarch, are to be read, not for their language only, but for the ethical teaching which they contain. After ethics succeeds rhetoric, to form the tongue and the imagination of the future orator. Italian is used to give a soft and melodious pronunciation ; Greek and Latin tragedies, with the humanists the food of school-boys, are reserved for the completion of the rhetorician's art. To this succeeds the study of politics, learned from the great masters of law from Moses to Justinian, continued down to the laws of our own constitution. Sundays are now to be spent in the higher branches of theology, and the scriptures are to be read in their original tongues. Not till now comes the study of history and poetry, mixed with a certain amount of logic ; and then, and not till then, are the scholars permitted to write for themselves. Original composition, instead of being, as among the Jesuits, the principal mental discipline even of young children, is to be reserved until the mind has been thoroughly penetrated both with matter and with manner.

A large portion of the proposed training is devoted to exercise. "In those vernal seasons of the year," says the poet, "when the air is calm and bracing, it were an injury and sullenness against nature not to go out and see her riches and partake in her rejoicing with heaven and earth. At this time the pupils might ride out with prudent and staid guides to all places of strength and commodities of building, and of soil for towns and tillage, harbors and ports for trade." Milton, in this vision of the future, does not intend to sketch a scheme of popular education, but one suited for select pupils and select teachers. It is strange that the advice of one who was himself a schoolmaster should have been so much neglected by the brothers of his profession. This may be explained by the fact that Milton wrote for an age in which Latin was the universal language, the common means of communication between scholars. The troubles of the seventeenth century left little room for the application of his theories ; and, when society had become sufficiently settled to adopt them, Latin had lost its place in the world of learning, and the standard of humanism had been raised aloft by the Jesuits.

The establishment of realism as an integral part of education is due to the French revolution, and it is inseparable from the name of Pestalozzi. There could not be a greater contrast than be-

tween Milton and Pestalozzi. Milton's educational scheme was derived, on the one hand from his poetical imagination, and on the other from his scorn for the shallowness and frivolity of some of the statesmen with whom he lived. Pestalozzi learned the principles of his art in the care of poor orphans and in the hard experience of his own checkered life. Milton's plan, like that of Plato, was adapted for a select number of rulers. Pestalozzi's plan was framed for the benefit of very little children, and has only been gradually seen to be applicable to all departments of education. In the year 1798 the village of Stanz, near the lake of Lucerne in Switzerland, was burned by the French, and a great part of the inhabitants murdered, because they would not receive the constitution offered to them by the directory of Paris. The children who escaped the slaughter were left homeless and orphans, and Pestalozzi was asked to take care of them. He established himself in a large deserted convent, deprived of all means of sustenance. He lived with the children by day, and slept with them by night, sharing the poor food which could be got together for their common support. It was by this close contact with the child-mind that Pestalozzi, almost himself a child, learned some of the deepest secrets of education. No traveller should look down from the Rhigi upon the valley where Stanz lies, without reverencing it as the birthplace of educational ideas which are destined to revolutionize our system of training. Yet when I rang, a few years ago, at the convent-gate, the good sister of charity who opened the door for me had never heard of the name of Pestalozzi, and knew nothing of the great Christian work which had been carried on within her walls. The central idea of Pestalozzi was to train the mind through the senses. Humanism, dealing with words alone, had depended mainly upon the memory. Children learned long lists of Latin and Greek nouns, long rules of Latin and Greek construction. Pestalozzi had no books. One of his best materials for instruction was an old piece of tapestry embroidered with animals. The children were taught to see, to touch, to taste, to smell, and to report exactly what their senses had taught them. By ingenious methods the first simple operations of the senses were made to lead insensibly to the higher operations of the mind. Milton had recommended that the rudiments of mathematics should be taught playing, as the old manner was. Pestalozzi made this plan a reality. Pestalozzi taught us to make the fullest use of a keen observation of young children, of their quick apprehension of what immediately surrounds them, and of their surprising power of retaining what really interests

them. He also taught us to follow, in the most loving and even servile manner, the growth of each child's mind, and of the child-mind as a whole. Yet it cannot be said that he was very successful as a practical teacher, and many who have posed as his disciples have been great failures. To force children by compulsion to learn many things by heart is the easiest, and it is also the most stupid and the most unfruitful, method of education. To follow the growth of their minds, and to adapt the training at each instant to their needs, require the patience of a saint and the insight of a philosopher, and these qualities are seldom found.

Fröebel may be regarded as one who has worked out with great minuteness and success a particular part of Pestalozzi's teaching. The kindergarten system, as it is called, rests upon the assumption that the senses of a child are to be first dealt with, and that it is by their means that the intelligence can be best aroused. Fröebel, starting with the care of very young children, was able to reduce their education to something like a system. They are taught by degrees to see clearly form and color; to imitate them in various ways; to distinguish by the touch hard and soft, cold and hot; to train their ears to delicate sounds, and their mouths to refined and expressive speech. Their restlessness is utilized for social drill and dances. A child is encouraged to imitate just what he understands, and no more. It is impossible to see a kindergarten class, even when composed of the youngest gutter children, without feeling that this must in time be recognized as the only fit education for the infant-mind.

But it is a mistake to suppose that the principles of Fröebel are applicable only to the training of very young children. It is as natural for the brain to grow and to exert itself as it is for the arms and legs to stretch themselves. Our inherited traditional methods of education are too often the swaddling-clothes of the mind, which impede its growth rather than assist its development. In schools higher than the kindergarten we have yet to learn that pleasure is a far more potent instrument of training than pain. Many teachers value lessons for their very harshness and repulsiveness, and take no pains that the mind should pass easily from the known to the unknown with ever-growing delight and satisfaction. Far too much stress is laid on mere memory. Memory depends on interest. Children will recollect accurately whatever has deeply roused them at any time. If we secure interest, memory will follow of itself. Again: schools spend far too much time on a set course of study. Pestalozzi and Fröebel learned all they knew by the

slavish following of the growing mind. It is probable that in no two minds do the faculties develop in precisely the same order. That curriculum is best which is adapted to the greatest number of minds, but no curriculum could be adapted to all minds. Just in proportion as the course of study laid down in school is rigid and unalterable, so far will it fail to reach a large number of those for whom it is intended. Just as, in elementary education, payment by results is opposed to the whole spirit of Pestalozzi's and Froebel's teaching, so in our higher education we cannot obtain the highest level of instruction unless we assign a lower place to examinations.

There is no fear that in the present day realistic education — the learning of things instead of words — will be neglected. There may, indeed, be a danger lest we should teach things which are not the best worth learning, lest we should waste on mechanical arts or on the lower branches of science powers which ought to be applied to the highest products of the human mind. Goethe tells us that Wilhelm Meister, a dreamy enthusiast, took his son Felix to be taught in the Paedagogic Province. On returning a year afterwards to see how he was getting on, he could not at first find him; but, as he was in an open field, he saw in the distance a cloud of dust. The dust developed into a troop of horses; and out of this troop galloped the young Felix, riding a white bare-backed steed, from which he threw himself and fell at his father's feet. The rulers of the Province explained, that, having tried Felix at every thing else, they found that he was most fit for breaking horses, and therefore set him that task. We now see Goethe's dream realized, not only in technical education, but in the schools which are growing up over England for the training of young colonists. A boy is taken at fourteen, and taught how to build a house, to make his furniture, to manage a farm, to navigate a boat. This is realistic education with a vengeance; and the same might be said of mere technical training, where it does not rest upon the basis of general culture. Yet the extravagances to which this side of education may run are slight, compared with those which have for so many years formed the bane of humanism. Some exaggeration is required to redress the balance. It is difficult to secure improvements in education, and it is almost impossible to revolutionize an educational system. Educational theorists write as if a single child, willing to be taught every thing, were dealt with by a teacher able to impart every thing. The reality is very different. Children are taught, not singly, but in masses; and in a crowd the standard of conduct is generally that of the worst

rather than that of the best. To secure all the attention of a large number of children needs considerable gifts, and to force a large class into active co-operation with the instructor is what few teachers can do. Again: a small proportion only of teachers have any special gifts of insight, liveliness, or imagination. They can only carry out the methods in which they have been trained. Once more every traditional system is protected by a large number of means and appliances for study which have grown up under its reign. The very perfection of the school-books makes it easier to study classical literatures and Greek and Roman history than any similar department of more modern date. The passive resistance of pupils, the absence of useful aids, the want of enterprise in teachers, — all militate against the substitution of a rational education, such as Comenius would have given, for the complete and elaborate drill in the arts of expression which we owe to Sturm and the Jesuits. America has been less spoiled than Europe by the influence of petty traditions; and it is there, perhaps, that we may look for the rise of a training which will begin with the kindergarten, will be inspired in its higher branches by the enthusiasm of Milton, will always pierce through the veil of words to the substance which the words are intended to convey, and, while training to the full the senses of the individual and his mechanical powers, will not fail to set the highest value on the best products of the human mind, and will never, in the pursuit of material science, undervalue the far dearer treasures of poetry and philosophy.

OSCAR BROWNING.

TRAINING OF TEACHERS.

THE history of our normal schools is the inside history of the progress of education in the United States. Established by prolonged struggles, maintained by continual contests, they have been the central point of onward movement. Circumstances have made them, at the best, but half-measures for the training of teachers. State normal schools are excellent high schools, and a little more. The general standard of admission is that of graduation from grammar schools, eight or nine years' course. Two years are spent in regular high-school studies; the third year a partial course in pedagogics and methods is begun; and the fourth year, psychology, pedagogics, methods, and practice form the principal work. Compare this with preparation for other professions, — four years high school, four years college, and then the law, medicine, or theological school. Rarely can a pupil study psychology with any profit until the